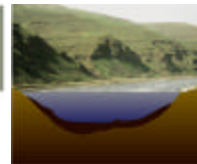




The Lower Snake River Juvenile Salmon
Migration Feasibility Report/
Environmental Impact Statement



Sediment Transport Analysis

Information on sediment transport analysis

The U.S. Army Corps of Engineers (Corps) continues to study ways to improve juvenile salmon passage through the hydropower system on the Snake River. As part of this effort the Corps released the Draft Lower Snake River Juvenile Salmon Migration Feasibility Report/Environmental Impact Statement (FR/EIS) in December 1999. These information sheets discuss specific topics covered in the FR/EIS. The entire FR/EIS can be found on line at <http://www.nww.usace.army.mil>. For more information contact Dave Dankel, Walla Walla District Corps, at (509) 527-7288, dave.a.dankel@nww01.usace.army.mil.

This information sheet provides a summary of the sediment transport analysis in the FR/EIS. It is important to note that this analysis is still preliminary, and is subject to review and revision.

Sediment Transport Under Alternatives 1, 2, and 3

Under Alternative 1—Existing Conditions, Alternative 2—Maximum Transport of Juvenile Salmon, and Alternative 3—Major System Improvements, Lower Granite Lake would continue to capture the current average annual sediment load of 3 to 4 million cubic yards per year that the lower Snake River is carrying due to basin runoff. About 80 percent of this sediment inflow is from the Snake River, while about 20 percent is from the Clearwater River.

Sediment Transport Under Alternative 4: Dam Breaching

Breaching of the four lower Snake River dams would allow the annual sediment load of 3 to 4 million cubic yards (2.3 to 3.1 million cubic meters) to be carried downstream to Lake Wallula, where the majority of incoming sediment would likely be deposited. Lake Wallula is created by McNary Dam, which is the first dam downstream on the Columbia from the Snake River confluence. The very finest silts and clays would be carried as suspended sediment downstream through Lake Wallula, with their ultimate destination likely being the Lower Columbia estuary or the Pacific Ocean.

Besides annual loads, recent sediment volume estimates indicate that approximately 100 to 150 million cubic yards of sediment have accumulated behind the four lower Snake River dams. Approximately 50 percent of this previously deposited sediment is expected to erode and move downstream within the first few years following dam breaching, particularly during peak flow periods. This translates to about 50 to 75 million cubic yards of material that could move downstream. The remainder of the sediments not eroded within the first few years of dam breaching would be subject to long-term erosion by wind and precipitation, and could eventually also be transported downstream to Lake Wallula.

How much is a million cubic yards?

One square mile (2.59 square kilometers) of land can be covered to a depth of approximately 1 foot (1/3 meter) by 1 million cubic yards (0.76 million cubic meters) of sediment.



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Sediment Deposition Patterns

It is difficult to estimate the volumes and locations in which the various sized particles that make up the accumulated sediment would be redistributed downstream. The majority of the initially eroded material would likely be redeposited in Lake Wallula between the Columbia-Snake River confluence and Wallula Gap, approximately 10 miles downstream. *Technical Appendix F—Hydrology/Hydraulics and Sedimentation* (Plates 20.1 to 20.5) shows the qualitative predictions of sediment deposition in Lake Wallula.

Since the flow velocities in Lake Wallula are generally slower than in the Snake River, the very coarsest cobble materials could be initially deposited in the vicinity of Ice Harbor Dam. It is possible that these sediments could also be resuspended and further transported downstream into Lake Wallula.

The smallest sediments would probably pass downstream through McNary Dam and continue to

be transported as suspended sediment downstream to the Columbia River estuary.

Potential Deposition Patterns

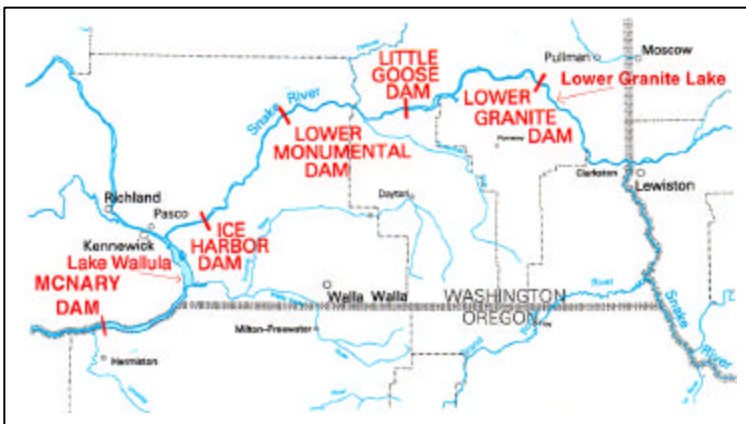
The east bank of the Columbia River, between its confluences with the Snake and Walla Walla rivers, appears to be susceptible to sediment deposition, based on qualitative analyses. Actual sedimentation patterns and depths are extremely difficult to predict in advance due to the numerous variable factors involved. These factors include the long term unpredictability of seasonal flows, uncertain land use practices, as well as the uncertainties of weather erosion due to precipitation and wind action.

The potential depth of sediment deposition in Lake Wallula is not likely to present navigation problems. Future proactive measures to protect irrigation water intakes from sedimentation effects might be required along this reach, although site-specific details are extremely difficult to predict in advance.

Redeposited sediment would likely cover large areas of benthic habitat, which could cause a major short-term disruption in the primary productivity and food supply for bottom feeders.

Costs

If the four lower Snake River dams were breached, the total cost for a sedimentation monitoring program designed to evaluate erosion and sediment transport during the first 10 years after dam removal is estimated to be \$2.2 million.



For details on total suspended solids (TSS) concentrations and affects on aquatic biota, please see the FR/EIS Main Report, p. 5.3-5, 5.3-6 at website <http://www.nww.usace.army.mil>, Feasibility Study/Draft FR/EIS.

